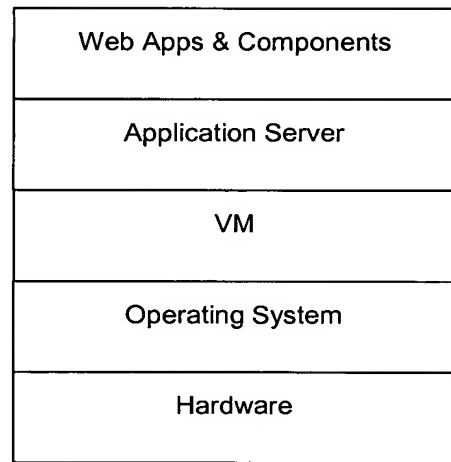


1990

FIG. 1A



Today

FIG. 1B

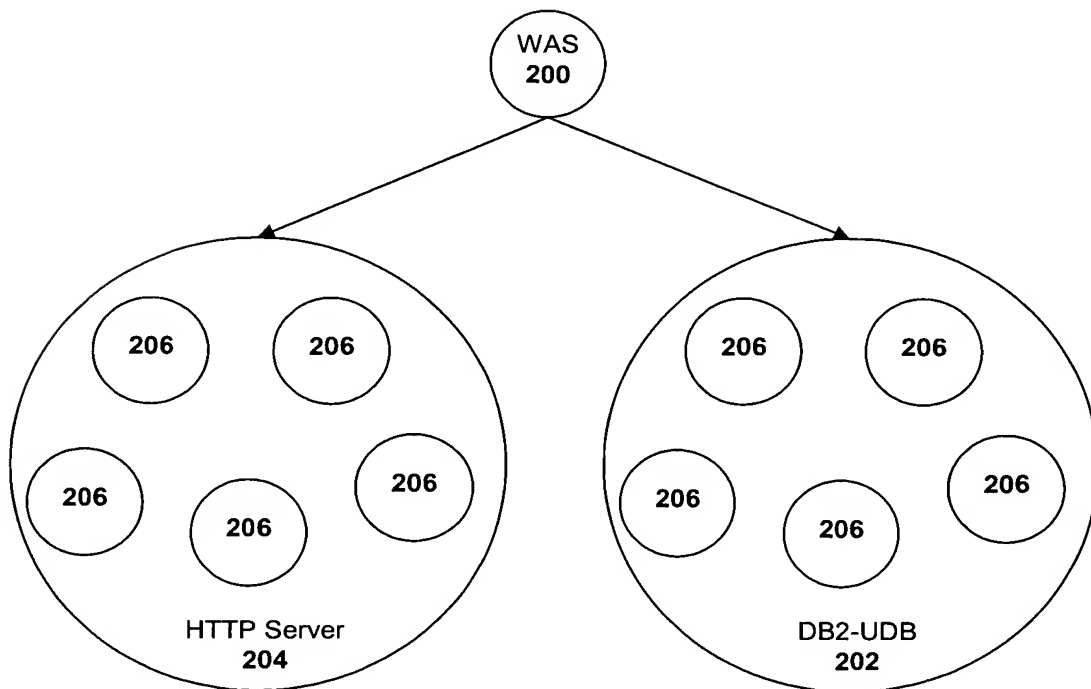


FIG. 2

```
SystemOut    0 ADMA6010I: The tasks are
[com.ibm.ws.management.application.task.ExtractionTask,
com.ibm.ws.management.application.task.CompiledJspTask,
com.ibm.ws.management.application.task.ConfigureTask,
com.ibm.ws.management.application.task.BackupAppTask]
[4/7/03 10:31:46:171 EDT] 3ccab45e SystemOut    0 ADMA6013I: Extract application binaries
at C:\DOCUME~1\sadtler\LOCALS~1\Temp\app_f4688a2b10\ear
[4/7/03 10:31:47:522 EDT] 3ccab45e SystemOut    0 Compiling jsps in Database_Testing.war
[4/7/03 10:31:47:522 EDT] 3ccab45e SystemOut    0 Invoking compilation ..
[4/7/03 10:31:49:746 EDT] 3ccab45e WebGroup    I SRVE0180I: [OnlineCatalog]
[/OnlineCatalog] [Servlet.LOG]:
[4/7/03 10:31:50:146 EDT] 3ccab45e WebGroup    I SRVE0180I: [OnlineCatalog]
[/OnlineCatalog] [Servlet.LOG]:
[4/7/03 10:31:53:131 EDT] 3ccab45e SystemOut    0 Errors compiling jsps in
C:\DOCUME~1\sadtler\LOCALS~1\Temp\app_f4688a2b10\ear\Database_Testing.war
[4/7/03 10:31:53:131 EDT] 3ccab45e SystemOut    0 Return code from jsp-compilation is: 1
[4/7/03 10:31:54:302 EDT] 3ccab45e SystemOut    0 Exception in jsp compile:
com.ibm.websphere.management.exception.AdminException: ADMA0021E: Error in compiling jsps -
Database_Testing.war (rc=1)
[4/7/03 10:31:54:703 EDT] 3ccab45e SystemOut    0 ADMA6012I: Exception in run
com.ibm.websphere.management.exception.AdminException: ADMA0021E: Error in compiling jsps -
Database_Testing.war (rc=1)
[4/7/03 10:31:54:703 EDT] 3ccab45e SystemOut    0 Exception:
com.ibm.websphere.management.exception.AdminException: ADMA0021E: Error in compiling jsps -
Database_Testing.war (rc=1)
[4/7/03 10:31:54:703 EDT] 3ccab45e SystemOut    0 ADMA6011I: Deleting directory tree
C:\DOCUME~1\sadtler\LOCALS~1\Temp\app_f4688a2b10
```

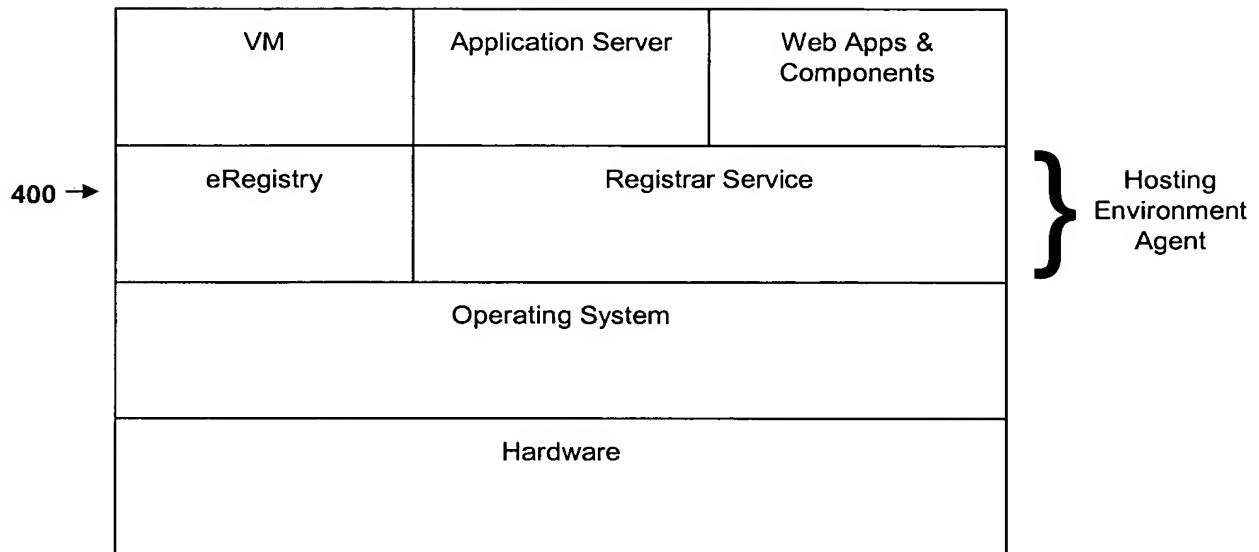


FIG. 4

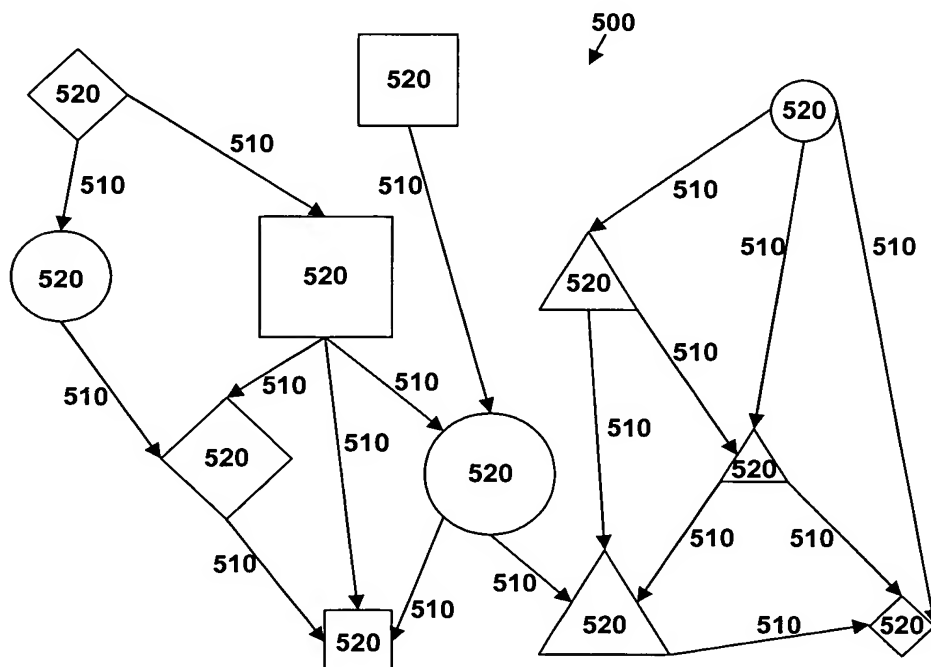


FIG. 5

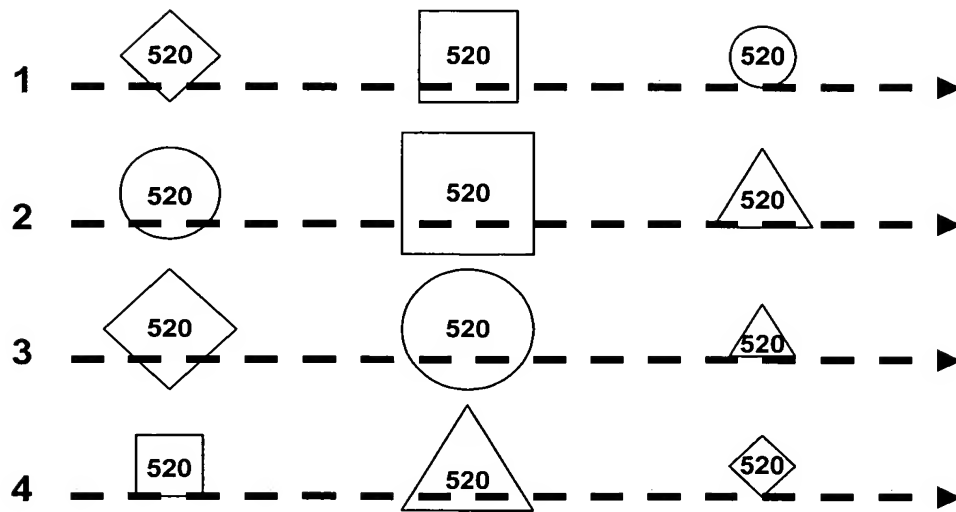


FIG. 6

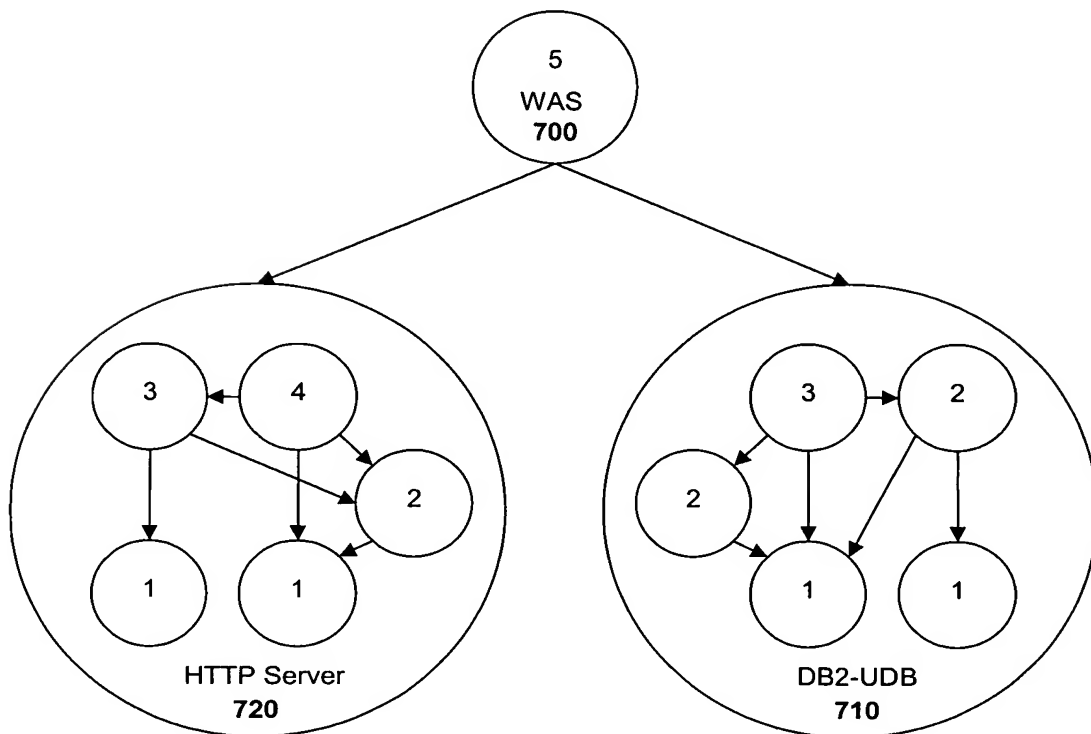


FIG. 7

```
INPUT:      a DAG representing the semantic model of the software  
components  
OUTPUT:    void  
do while(there are nodes unmarked)  
    // a leaf node is a node with incoming edges only  
    if (there are leaf node)  
        Nodes_to_install_in_parallel ← leaf nodes  
    else  
        Nodes_to_install_in_parallel ← chose randomly a node  
        at the lowest level in the DAG  
  
    Install(Nodes_to_install_in_parallel)  
  
    Delete the install nodes and their incoming edges ()  
enddo
```

**FIG. 8**

```
-- WAS  
  -- IBM HTTP SERVER  
    + CHECKS  
    + DEPLOY  
    + SETUP  
    + CLEAN UP  
  
  + IBM DB2 UDB  
  
  -- APPLICATION SERVER  
    + WAS  
    + SERVER PLUG-INS  
    + APPLICATION ASSEMBLY AND DEPLOYMENT TOOL  
    + DEPLOYMENT TOOL  
    + APPLICATION SERVER EXAMPLES  
    + MESSAGE DRIVEN BEAN SAMPLES  
    + ANT UTILITIES  
  
  -- ADMINISTRATIVE TOOLS  
    + ADMINISTRATION CONSOLE  
    + ADMIN SCRIPTING
```

**FIG. 9A**

```
-- WAS
-- IBM HTTP SERVER
-- CHECKS
-- Check memory OK
-- Check Disk Space OK
-- Check CPU OK
-- Check Windows OK
-- Check Windows Patches OK
-- DEPLOY
-- Create Directory ${install.path}/IBM HTTP Server
-- Create Directory ${install.path}/IBM HTTP Server/tmp
-- Create Directory ${install.path}/IBM HTTP Server/bin
-- Create Directory ${install.path}/IBM HTTP Server/register
-- Create Directory ${install.path}/IBM HTTP Server/license
-- Create Directory ${install.path}/IBM HTTP Server/samples
-- Copy File ${install.from}/setup/server.zip
    to ${install.path}/IBM HTTP Server/tmp
    .....
-- SETUP
-- Extract ${install.path}/IBM HTTP Server/tmp/server.zip
-- Run ${install.path}/IBM HTTP Server/tmp/setup/install.exe
    .....
-- CLEAN UP
    .....

-- IBM DB2 UDB
    .....

-- APPLICATION SERVER
-- WAS
    .....
-- SERVER PLUG-INS
    .....
-- APPLICATION ASSEMBLY AND DEPLOYMENT TOOL
    .....
-- DEPLOYMENT TOOL
    .....
-- APPLICATION SERVER EXAMPLES
    .....
-- MESSAGE DRIVEN BEAN SAMPLES
    .....
-- ANT UTILITIES
    .....

-- ADMINISTRATIVE TOOLS
-- ADMINISTRATION CONSOLE
    .....
-- ADMIN SCRIPTING
    .....
```

**FIG. 9B**